

[0077] The tuner circuitry 54 is coupled to the first feed point 26 and located adjacent the first feed point 26 on the ground member 18. The tuner circuitry 54 is configured to provide dynamic control of the impedance of the first antenna. The apparatus 52 may also include additional tuner circuitry (not illustrated in FIG. 3) that is coupled to the second feed point 28 and is located adjacent the second feed point 28 on the ground member 18. The additional tuner circuitry is configured to provide dynamic control of the impedance of the second antenna.

[0078] FIG. 4 illustrates a perspective view of an apparatus 64 according to various examples. The apparatus 64 is similar to the apparatus 22 and 52 illustrated in FIGS. 2 and 3, and where the features are similar, the same reference numerals are used.

[0079] The apparatus 64 differs from the apparatus 22 and 52 in that the apparatus 64 further comprises a second cover member 66 that is configured to define an exterior surface of the electronic device 10. The second cover member 66 may be a rear cover of the electronic device (as illustrated in FIG. 4). The second cover member 66 overlays the first cover member 24 (that is, the second cover member 66 overlays the first edge 32, the second edge 34, the third edge 56 and a fourth edge 67 of the first conductive portion 30) and is coupled to the first cover member 24.

[0080] The second cover member 66 includes a second conductive portion 68 and a non-conductive portion 70. The second conductive portion 68 extends from the fourth edge 67 towards the first edge 32, and the non-conductive portion 70 extends from the first edge 32 towards the fourth edge 67. The second conductive portion 68 has a greater surface area than the non-conductive portion 70.

[0081] The second conductive portion 68 is coupled to the ground member 18 and is therefore grounded. The third edge 56 of the first conductive portion 30 and the second conductive portion 68 define a slot 72 there between. The slot 72 has an electrically open end adjacent the first edge 32 and a closed end opposite the open end. The electrically open end of the slot 72 overlaps with the non-conductive portion 70 of the second cover member 66 and consequently, the first conductive portion 30 is grounded to the second conductive portion 68 at the closed end of the slot 72.

[0082] The grounding connection between the first conductive portion 30 and the second conductive portion 68 at the closed end of the slot 72 provides a second electrical length for the first antenna and may enable the first antenna to operate in a further operational frequency band. The second electrical length (and hence the further operational frequency band) may be selected by providing the slot 72 with an appropriate length. For example, where it is desired for the first antenna to operate at relatively high frequencies, the slot 72 may be manufactured to have a relatively short length, thus providing a relatively short second electrical length. By way of another example, where it is desired for the first antenna to operate at relatively low frequencies, the slot 72 may be manufactured to have a relatively long length, thus providing a relatively long second electrical length.

[0083] In some examples, the second edge 34 of the first conductive portion 30 and the second conductive portion 68 define a slot there between as described above with reference to the slot 72. The slot defined by the second edge 34 and the second conductive portion 68 provides an additional electrical length and may enable the second antenna to operate in a further operational frequency band.

[0084] FIG. 5 illustrates a perspective view of another apparatus 74 according to various examples. The apparatus 74 is similar to the apparatus 22, 52 and 64 illustrated in FIGS. 2, 3, and 4 respectively and where the features are similar, the same reference numerals are used.

[0085] The apparatus 74 differs from the apparatus 22, 52, 64 in that the apparatus 74 further comprises a third cover member 76 that is configured to define an exterior surface of the electronic device 10. For example, the third cover member 76 may be a front cover of the electronic device (as illustrated in FIG. 5) and include a display 78. The third cover member 76 overlays the first cover member 24 (that is, the third cover member 76 overlays the first edge 32, the second edge 34, the third edge 56 and the fourth edge 67 of the first conductive portion 30) and is coupled to the first cover member 24.

[0086] The third cover member 76 includes a third conductive portion 80 that extends underneath the display 78 and is coupled to the second edge 34 and to the third edge 56. The third conductive portion 80 is coupled to the ground member 18 and is therefore grounded. The third edge 56 of the first conductive portion 30 and the third conductive portion 80 define a slot 82 there between. The slot 82 has an electrically open end adjacent the first edge 32 and a closed end opposite the open end. Consequently, the first conductive portion 30 is grounded to the third conductive portion 80 at the closed end of the slot 82.

[0087] The grounding connection between the first conductive portion 30 and the third conductive portion 80 at the closed end of the slot 82 provides a further electrical length for the first antenna and may enable the first antenna to operate in another operational frequency band. The further electrical length (and hence the further operational frequency band) may be selected by providing the slot 82 with an appropriate length. For example, where it is desired for the first antenna to operate at relatively high frequencies, the slot 82 may be manufactured to have a relatively short length, thus providing a relatively short further electrical length. By way of another example, where it is desired for the first antenna to operate at relatively low frequencies, the slot 82 may be manufactured to have a relatively long length, thus providing a relatively long further electrical length.

[0088] In some examples, the second edge 34 of the first conductive portion 30 and the third conductive portion 80 define a slot there between as described above with reference to the slot 82. The slot defined by the second edge 34 and the third conductive portion 80 provides an additional electrical length and may enable the second antenna to operate in a further operational frequency band.

[0089] It should be appreciated that the features of the apparatus 22, 52, 64 and 74 may advantageously be combined so that the first antenna is configured to operate in at least three operational frequency bands (provided by the first conductive portion 30 being grounded to the ground member 18, the second conductive portion 68 and the third conductive portion 80). Similarly, the second antenna may be configured to operate in at least three operational frequency bands.

[0090] FIG. 6 illustrates a plan view of a further apparatus 84 according to various examples. The apparatus 84 is similar to the apparatus 22, 52, 64 and 74 illustrated in FIGS. 2, 3, 4 and 5 respectively and where the features are similar, the same reference numerals are used. The apparatus 84 differs in that the apparatus 84 additionally comprises a third feed point 86 and a fourth feed point 88 positioned adjacent the fourth edge 67 of the first conductive portion 30. Furthermore, the second